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that of the Prairie States

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No. 6.

INDIANA DUNE PLANT NOTES.

DONALD C. PEATTIE.

In the preparation of a manual of the flora of the Indiana sand dune country at the head of Lake Michigan, some new species and varieties of plants have been discovered, and from a nomenclatorial point of view it is desirable to publish a few combinations. As such taxonomic matters do not find a convenient place in a manual intended for popular use, the new names and combinations are therefore being published first in regular botanical periodicals.

Typha angustifolia L. var. *calumetensis* Peattie, var. nov. Caulis 0.5-1 m. altus, tenuissimus, foliis 1.5-3 dm. longis, 3-6 mm. latis, saepe involutis; inflorescentia staminea vix 4 mm. in diametro, 7 cm. longa; foeminea 3-10 cm. longa, 3-10 mm. in diametro; rhachis nuda 6 cm. longa.

A remarkable dwarf plant, lower, and extremely slender in all its parts. Growing with *T. latifolia* L., but obviously by its reproductive characters a variety of *T. angustifolia* from which it differs only in vegetative ways. Type specimens in Field Museum, Chicago: Peattie No. 278. Pine, Ind. Aug. 20, 1920; and No. 2340. Marshes of the Grand Calumet at Clarke, Ind., July 28, 1926.

This plant is so suitable for ornamental purposes on account of its dainty growth that it is cut in immense quantities on the marshes of the Grand Calumet every year and is sold in the flower markets in Chicago. It is not, as might be supposed, an immature condition of true *T. angustifolia* L., which has very slender spikes when green. The variety *calu-*

metensis is just as narrow when it goes to seed. Although many varieties of *T. angustifolia* have been described none of them coincide with the specimens cited.

Commelina communis L. var. *verticillata* Peattie, var. nov. caulibus crassioribus, ramis omnibus verticillatis, foliis late ovatis, acutis, vaginis grandibus scariosisque.

Similar in flowers, spathes and seeds to the typical plant, but the branches all in whorls of 3-5 and the leaves broadly ovate; large ovate-lanceolate papery bracts accompany each verticel.

Type specimens in Field Museum, Chicago: C. W. Duesner, Pine, Oct. 31, 1908.

Rumex altissimus Wood. var. *abortivus* Peattie, var. nov., singula granularum grandi prominente, aliis plus minusque abortivis.

Precisely similar to the typical plant in vegetative ways, and having similar valves, but only one of the grains large and prominent, the others variably reduced or absent. As traces of all three grains are usually present in this variety it might be thought the specimens representing it were nothing but *R. mexicanus* Meisn., but it is obvious to anyone familiar with the vegetative appearance of *R. altissimus* that var. *abortivus* is but a phase of it.

Type specimens in Field Museum, Chicago. Peattie No. 2350. East Gary, Ind., July 28, 1926.

Gratiola mesochora Peattie, sp. nov. Caulis tenuis, 5-10 cm. altus; corollis flavis; capsulis vel sessilibus, vel vix pedunculatis.

A low-growing plant; leaves only about five pairs, 1.7-3 cm. long, ovate-lanceolate to oblong-ovate, mostly entire or obscurely repand and narrowed to a bluntish tip, rarely somewhat spatulate and toothed at tip; corolla bright yellow throughout, about 7 mm. long; calyx 2-3 mm. long, its teeth deltoid; pod broad, often broader than long, not over 5 mm. long, usually less, sessile or practically so.

Type specimens in Field Museum, Chicago: Umbach. Ponds, Clarke, Ind., Sept. 10, 1898.

This interesting little plant is in reality a close relative of *G. virginiana* L. and *G. sphaerocarpa* Ell., as it has the broad

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anther connectives, the diffuse or creeping stems, and the foliaceous bracts, and no sterile filament. Its bright yellow corolla however recalls *G. aurea* Muhl. though it is much shorter. It differs from both *G. virginiana* and *G. sphacrocarpa* in being 1 dm. or less tall, in having an entirely yellow corolla, and nearly sessile fruit.

Helianthus giganteus L. var. *microcephalus* Peattie. Foliis vix 1.5 cm. latis, integris vel sparse sinuatis, inferne pallidis; caulis tenuis; capitibus parvulis; pedunculis tenuibus, bracteis brevioribus; radiis brevioribus, tenuibus.

Type specimens in U. S. National Herbarium, Washington, D. C., Umbach: Clarke, Sept. 9, 1897.

A plant of most striking dissimilarity from *Helianthus giganteus* in vegetative ways and as regards size, but separable on no important reproductive characters. On the whole the leaves are very much narrower than most of the specimens of *H. giganteus*, and are more sparsely repand-denticulate or even entire; lower surface distinctly paler, and while somewhat scabrous it is much less so than in the true species; stem more slender and more sparsely hairy instead of abundantly strigose. The heads are much smaller, on slender peduncles, the bracts shorter, possibly somewhat less ciliate than in most specimens of the true species, and narrower and shorter as are the rays.

A few new combinations are unavoidable, and it is therefore desired to publish the following:

Persicaria mitis Gilib. var. *ruderalis* (Salisb.) Peattie. comb. nov. If the generic name *Persicaria* is to be taken up for one group of the species comprised in the wider genus *Polygonum*, and it has seemed expedient to do so in the preparation of this flora, then the name of the familiar lady's thumb, *Polygonum Persicaria* L. Sp. Pl. 361. 1753, so abundantly naturalized from Europe, must be *Persicaria mitis* Gilib. Exerct. Phyt. 2: 431, 1792. This is necessary, by the International Rules, in order to avoid the duplicate binomial, *Persicaria Persicaria* (L.) Small Fl. S. E., U. S., 378, 1903. Salisbury's *Polygonum rudemale* (Prodr. 259, 1796) has been made a variety of *Polygonum Persicaria* L. (Meisn. in DC. Prodr. 14: 118, 1856), and is now transferred as the rules

require to a variety of *Persicaria mitis*. It has prostrate or slightly ascending stems, with frequently appressed-pubescent leaves.

Persicaria punctata (Ell.) Small. var. *leptostachya* (Meisn.) Peattie. comb. nov. *Polygonum acre* Lam. var. *leptostachyum* Meisn, in DC. Prodr. 14: 108, 1856. *Polygonum punctatum* Ell. var. *leptostachyum* (Meisn.) Small Bull. Torr. Bot. Club, 19: 356, 1892.

Liatris scariosa Willd. var. *Deamii* (Lunell) Peattie comb. nov. *Lacinaria Deamii* Lunell. Am. Mid. Nat. 2: 169, 1912.

Ribes americana Mill. var. *mesochora* (Nieuwland) Peattie comb. nov. *Coreosma americana* (Mill.) Nieuwland var. *mesochora* Nieuwland Am. Mid. Nat. 4: 60, 1915.

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NOTES ON TREES AND SHRUBS OF MISSOURI.

BY BENJAMIN FRANKLIN BUSH.

It is now nearly or quite forty years since Tracy published his *Flora of Missouri*,* in which were recorded a great many species of trees and shrubs for the State. This *Flora* of Tracy's was largely a compilation of the lists, reports, citations, collections and notes of other collectors and writers, all amateurs in the study of plants, or inexperienced observers, or those unfamiliar with the *Flora* of the State.

The consequences of these uncertain records of Tracy's were that quite a number of species of trees and shrubs, as well as herbaceous plants, were listed as Missouri species, being based on misidentifications, wrong labels, or gross negligence in making up of lists, or on indefinite citing of localities where specimens were collected.

A few species recorded by Tracy in his *Flora* rested upon publications and collections of half or three-quarters of a century before, when the limits of the State were but little understood, and when collectors were prone to label their collections "Saint Louis," or "Missouri," when in reality they were collected in Arkansas, Louisiana or Montana.

The sources from which Tracy drew his material for his *Flora* may be arbitrarily divided into two classes, those before and up to the year 1880, and those after 1880, and up to the year 1885. There are in the first class such collectors and writers as Geyer, Pech, Engelmann, Swallow, Broadhead and Torrey and Gray. In the second class are found Murtfeldt, Shepard, Wirick, Tracy, Galloway, Kellogg and Bush. The following list is arranged in accordance with the arrangement of the families in Tracy's *Flora*, and a few other species are included in it that were not known to Tracy at the time he prepared his *Flora*, or had not been cited or

Tracy, S. M., Catalogue of the Phaenogamous and Vascular Cryptogamous Plants of Missouri, 1886.

recorded for Missouri at that time, that the list may be as much up to date as possible.

1. *MAGNOLIA GLAUCA* Linnaeus.

SWEET BAY.

Recorded for Missouri by Tracy on authority of Torrey and Gray, who cited this species for Missouri in their Flora of North America, which evidently was based on specimens collected much south of this State. Prior to the publication of Torrey and Gray's Flora, many of the early collectors were very indefinite in the labeling of their specimens, and no doubt through a misleading label some collection was credited to Missouri that was collected south of the present State line.

As Arkansas was a part of Missouri from 1812 to 1819, the specimens upon which this citation rested, must probably have been collected during that period. Torrey and Gray cite a number of other species of plants for Missouri, that are not known to occur in the State, among which are *Potentilla arguta*, *Prunus pumila*, *Lepidium ruderalis*, *Artemisia frigida* and *Gaillardia aristata*.

2. *HYPERICUM ADPRESSUM* Barton.

ST. JOHN'S-WORT.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

Recorded for Jackson and Henry Counties by Tracy on authority of Bush, but the writer at that time was not able to determine specifically such species as this, that are closely related to other species, and the determination was based on collections of *H. cistifolium*.

At the time the writer furnished Tracy with his notes on Missouri plants, he knew about as little about the Flora of Missouri as any of the other collectors, and he reported to Tracy, amongst others, the following: *Pirus angustifolia*, *Viola primulaefolia*, *Spiraea salicifolia*, *Desmodium rigidum*, *Crataegus punctata*, *Galium latifolium*, *Amelanchier canadensis*, *alnifolia*, *Ludwigia alata*, *Cornus stolonifera*, *Nasturtium palustre hispidum*, *Solidago Shortii*, *Aster Shortii*, *Aster tenuifolius*, *Eupatorium aromaticum*, *Heliopsis gracilis*, *Rudbeckia bicolor*, *Helianthus strumosus*, *Scutellaria pilosa*, *Salix*

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lucida, *Salix petiolaris*, *Populus grandidentata*, *Lilium carolinianum*, *Hydrophyllum macrophyllum*, *Cyperus compressus*, *Scirpus Torreyi*, *Lepidium ruderales*, *Elymus Sitanion*, *Rosa nitida*, *Carex acutiformis*, *Carex echinata*, *Carex striata*, *Carex Vaseyi* and *Potentilla supina*, all of which were based on misidentifications on my part.

Recorded for Saint Louis County by Tracy on authority of Kellogg, and probably based on specimens of *H. cistifolium*, as Kellogg was too inexperienced in the determination of species to be able to separate these. Kellogg also reported to Tracy for Missouri, *Plantago patagonica*, a species not accepted for the State now.

3. HYPERIUM AUREUM Barton.

ST. JOHN'S-WORT.

Recorded for Pike County by Tracy on authority of Pech, but evidently an error on the part of Pech in cataloguing. Pech collected in Missouri about Louisiana and Potosi during 1841 and 1842, but his Catalogue of Plants was not published until about 1867. In this catalogue are also included species collected in Indiana, and it is probable that some of these Indiana plants were accidentally listed for Louisiana, Missouri. Amongst others, Pech lists in his Catalogue for Missouri such species as follows: *Nasturtium lacustre*, *Nasturtium sylvestre*, *Viola canadensis*, *Viola canina sylvestris*, *Viola hastata*, *Viola cucullata cordata*, *Hypericum ellipticum*, *Psoralea canescens*, *Desmodium rigidum*, *Lathyrus maritimus*, *Rubus cuneifolius*, *Geum rivale*, *Crataegus punctata*, *Lechea minor*, *Lechea thymifolia*, *Ludwigia linearis*, *Angelica Curtisii*, *Archangelica Gmelini*, *Oldenlandia glomerata*, *Liatris dubia*, *Cacalia suaveolens*, *Aster grandiflorus*, *Aster Shortii*, *Helianthus decapetalus*, *Helianthus giganteus*, *Coreopsis discoidea*, *Geranium dissectum*, *Prenanthes crepidinea*, *Phacelia fimbriata*, *Phlox reptans*, *Senecio tomentosus*, *Eriophorum gracile*, *Carex intumescens*, *Carex novae-angliae*, *Carex Tuckermani*, *Carex eburnea*, *Carex conoidea*, *Carex aristata*, *Carex arida*, *Carex siccata*, *Carex Willdenovii*, *Carex bromoides*, *Carex filiformis*, *Artemisia canadensis*, *Myosotis arvensis*, *Scutellaria nervosa*, *Leonurus Marrubiastrum*, *Coreopsis trichosperma*, *Zannichellia palustris*, *Cyperus dentatus*, *Mil-*

lium effusum and *Scirpus polyphyllus*, all unknown species to the Missouri Flora as understood today.

4. *HYPERICUM DENSIFLORUM* Pursh. ST. JOHN'S-WORT.

Recorded for Missouri by Small in Flora, citation probably based on my No. 282, collected in low sandy woods at Pleasant Grove, Missouri, and determined by me as *H. densiflorum*. A careful examination of these specimens should disclose their identity with this species, or to the recently described species, *H. oklahomense*.

5. *HYPERICUM NUDIFLORUM* Michaux. ST. JOHN'S-WORT.

Recorded for Greene County by Tracy on authority of Shepard, but undoubtedly an error in determination. Shepard was more a geologist than botanist, and he was not well acquainted with the Flora of Missouri, and amongst other species, he reported for Missouri the following: *Geranium Robertianum*, *Hypericum canadense*, *Sedum stenopetalum*, *Lechea minor*, *Astragalus plattensis*, *Fragaria vesca*, *Potentilla argentea*, *Phlox amoena*, *Amelanchier canadensis oblongifolia*, *Oldenlandia glomerata*, *Hydrangea radiata*, *Aster junceus*, *Nasturtium lacustre*, *Pycnanthemum leptodon*, *Pedicularis lanceolata* and *Vaccinium corybosum*, species that are not known now for Missouri.

6. *ILEX LAEVIGATA* A. Gray. SMOOTH WINTERBERRY.

Recorded for Missouri by Tracy on authority of Swallow, but Swallow undoubtedly made a mistake in determination. This reference was probably from some one of Swallow's Geological Reports, as Swallow was a geologist and knew but very little about trees and shrubs. That Swallow was not very well acquainted with species of plants is shown in his report for Missouri the following: *Ilex verticillata*, *Spiraea betulifolia*, *Crataegus flava*, *Oenothera glauca*, *Bartonia tenella*, *Breweria aquatica*, *Castanea vulgaris Americana*, *Alnus incana*, *Asclepias paupercula*, *Quereus cinerea*, *Limnobia Spongia*, *Veratrum parviflorum*, *Smilax tannifolia* and *Smilax glauca*, all of which are unknown for Missouri at this time.

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7. *AESCULUS FLAVA* Aiton.

YELLOW SWEET BUCKEYE.

Recorded for Missouri on his own authority, who says it is common in the State, but he must have had *Ae. glabra* in mind when he wrote that. Tracy did not have much of an idea of the Flora of Missouri, for he cites as Missouri species the following: *Sisymbrium Thaliana*, *Anemone nemorosa*, *Rhus typhina*, *Viola primulaefolia*, *Viola cucullata cordata*, *Rubus strigosus*, *Rubus trivialis*, *Rosa blanda*, *Rosa lucida*, *Pirus angustifolia*, *Cerastium oblongifolium*, *Crataegus coccinea*, *Crataegus Crus-galli*, *Crataegus flava*, *Crataegus punctata*, *Uvularia perfoliata*, *Ribes aureum*, *Ribes rotundifolium*, *Oenothera fruticosa linearis*, *Conioselinum canadense*, *Vernum viride*, *Cornus circinata*, *Viburnum dentatum*, *Viburnum Lantanoides*, *Plantago heterophylla*, *Spiraea salicifolia*, *Fragaria virginiana*, *Galium latifolium*, *Lycopodium dendroideum*, *Chenopodium capitatum*, *Artemisia vulgaris*, *Coreopsis trichosperma*, *Senecio vulgaris*, *Lonicera flava*, *Urtica dioica*, *Helianthus doronicoides*, *Viola rotundifolia*, *Viola cucullata*, *Viola cucullata palmata*, *Quercus coccinea*, *Phlox maculata*, *Vincetoxicum nigrum*, *Phlox reptans*, *Heliopsis laevis*, *Vaccinium pennsylvanicum*, *Betula alba populifolia*, *Populus grandidentata*, *Lilium philadelphicum*, *Tradescantia rosea*, *Orontium aquaticum*, *Agostis elata*, *Andropogon dissitiflorus*, *Lilium Catesbaei*, *Equisetum hyemale*, *Aspidium Lonchitis* and *Aristida purpurea*, all species not known to occur in the State.

Tracy's collection is in all probability at the State University at Columbia, Missouri, and an examination of the specimens should show just what it was that Tracy collected.

8. *ACER PENNSYLVANICUM* LINNAEUS.

STRIPED MAPLE.

Recorded from Iron County by Tracy on authority of Galloway, but Galloway made many mistakes in his determinations, as is shown by the following list: *Draba verna*, *Agrostis elata*, *Stellaria borealis*, *Smilax tamnoides*, *Callirrhoe triangulata*, *Poa brevifolia*, *Poa nemoralis*, *Viola hastata*, *Hypericum angulosum*, *Plantago patagonica*, *Lupinus perennis*, *Aristolochia Siphon*, *Oenothera riparia*, *Hydrolea quadrivalvis*, *Cornus stolonifera*, *Liatris elegans*, *Pirus angustifolia*,

Valerianella chenopodifolia, *Solidago bicolor*, *Phlox procumbens*, *Aster undulatus*, *Gnaphalium decurrens*, *Iva frutescens*, *Deschampsia caespitosa*, *Chionanthus virginica*, *Pellaea gracilis* and *Stipa avenacea*, all of which are unknown to the writer as Missouri species at this time.

Galloway made a large collection of plants in Mississippi County, and these were mainly determined by Tracy, and these specimens should be in the Herbarium of the University of Missouri, at Columbia, and an examination of this collection will throw some light on Tracy's determinations.

9. RHUS TYPHINA Linnaeus.

STAGHORN SUMAC.

Recorded as common in Missouri by Tracy on his own authority, but no specimens of this species are known from Missouri, and Tracy's determinations were probably based on *R. copallina*, which is commonly mistaken for *R. typhina*.

Cited for Missouri by Britton in Manual, evidently copied from some earlier record, probably Tracy's.

10. RHUS VENENATA D.

POISON SUMAC.

Recorded for Greene County by Tracy on authority of Shepard, but this must have been a mistake, as no one else has seen this species in Missouri, and recent collections all around Greene County have failed to reveal this species.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

The two citations above must have been copied from some earlier record, probably Tracy's.

11. PRUNUS PENNSYLVANICA Linnaeus.

WILD RED CHERRY.

Recorded for Adair County by Tracy on authority of Broadhead, but Broadhead was a geologist and had but little knowledge of the Missouri Flora, he having reported for Missouri the following: *Anemone parviflora*, *Anemone decapetala*, *Anemone nemorosa*, *Vesicaria Shortii*, *Delphinium exaltatum*, *Polygala Nuttallii*, *Arenaria stricta*, *Geum macrophyllum*, *Gaylussacia dumosa*, *Salix candida*, *Amaranthus Blitum*, *Hieracium canadense*, *Coreopsis gladiata*, *Galium asprellum*, *Phlox amoena*, *Lobelia Kalmii*, *Lechea minor*, *Pil-*

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laea gracilis, *Gentiana angustifolia*, *Opuntia missouriensis*, *Linum Boottii*, *Hibiscus Moscheutos*, *Viola lanceolata*, *Viola canina sylvestris*, *Baptisia alba*, *Hypericum graveolens*, *Pirus arbutifolia*, *Conioselinum canadense*, *Viburnum lantanoides*, *Lonicera hirsuta*, *Liatris elegans*, *Aster reticulatus*, *Helianthus angustifolius*, *Pyrrhopappus scaposus*, *Vaccinium corymbosum*, *Leucothoe racemosa*, *Arctostaphylos Uva-Ursi*, *Rhododendron nudiflorum*, *Phlox reptans*, *Lilium Catesbaei*, *Tradescantia rosea*, *Botrychium matricariaefolium*, *Aspidium Lonchitis*, *Scirpus polyphyllus*, *Botrychium ternatum*, *Andropogon macrourus*, *Veratrum parviflorum* and *Juncus setaceus*, all species that are now not regarded as Missouri plants.

Recorded for Pike County by Tracy on authority of Pech, but undoubtedly a mistake in labeling.

Recorded for Saint Louis County, by Tracy on authority of Murtfeldt, but Miss Murtfeldt was more an entomologist than botanist, and did not know the Missouri plants as well as she did the insects, as the following list will show: *Anemone nemorosa*, *Opuntia vulgaris*, *Ranunculus pennsylvanicus*, *Lupinus perennis*, *Viburnum Opulus*, *Aster longifolius*, *Aster tenuifolius*, *Pluchea camphorata*, *Lysimachia stricta*, *Deschampsia flexuosa* and *Schweinitzia odorata*, all quite unknown to the writer as Missouri plants.

12. PRUNUS PUMILA Linnaeus.

SAND CHERRY.

Recorded for Missouri by Tracy on authority of Torrey and Gray in Flora of North America, but evidently the reference in Torrey and Gray was based on some specimen collected much farther north of Missouri.

13. PRUNUS UMBELLATA Elliott.

SLOE.

Recorded for Miller County on authority of Wirick, but Wirick was merely an amateur in Botany, and never progressed beyond that stage, and he reported the plants of Miller County to the writer about 1883. In his list of Miller County species are the following: *Viola rostrata*, *Ranunculus muricatus*, *Delphinium exaltatum*, *Baptisia alba*, *Crataegus coccinea viridis*, *Heliopsis laevis*, *Bumelia tenax*, *Scutellaria saxatilis*, *Callicarpa americana*, *Calamintha glabella*, *Asclepias viridula*, *Anantherix connivens*, *Phlox amoena*, *Tofieldia*

glabra, *Gaylussacia resinosa*, *Lepidium ruderales* and *Aspidium Lonchitis*, all unknown to the writer at the present time as Missouri species.

Tracy also records *Prunus virginiana* as common in Missouri, but yet only a few collectors have ever seen this species in the State, and it only occurs in one or two tiers of counties along the northern boundary.

14. SPIRAEA BETULIFOLIA Pallas.

SPIRAEA.

Recorded for Putnam County by Tracy on authority of Swallow, but no doubt based on specimens of some other species, probably *Opulaster*. For remarks on this collector's ability to distinguish species of plants, see *Ilex laevigata*.

15. SPIRAEA SALICIFOLIA Linnaeus.

MEADOW-SWEET.

Recorded for Jackson County by Tracy on authority of Bush, but this was a mistake. The plants were recognized and identified by Mr. Mann, who claimed he knew the species in New York, and the writer was with him when the plants were found at Lake City.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Robinson and Fernald in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

Cited for Missouri by Small in Flora.

In some way the citation to Missouri got started, and every author copied it until it got to be pretty firmly fixed in the books, but there are no specimens to support these citations.

16: RUBUS CUNEIFOLIUS Pursh.

SAND BLACKBERRY.

Recorded for Pike County by Tracy on authority of Pech, but Pech must undoubtedly have misidentified his specimen if collected in Pike County, or he must have collected them elsewhere. As the Pech collection is now lost, it is impossible to determine just what species his specimens really were.

Cited for Missouri by Robinson and Fernald in Manual.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

Cited for Missouri by Small in Flora.

It is rather curious how all these citations could have been given, when there are no specimens upon which to base them, but evidently each author copied after the others.

17. RUBUS VILLOSUS FRONDOSUS Torrey. BLACKBERRY.

Recorded from Jackson County by Tracy on authority of Bush, but at that time the writer knew scarcely anything about the species of *Rubus*, and consequently erred in making the determination. No doubt based on what is known as *R. alumnus* Bailey.

18. RUBUS STRIGOSUS Michaux. WILD RED RASPBERRY.

Recorded by Tracy as common in Missouri on his own authority, but no specimens are known of this species from Missouri, although it is probable that it does occur in the extreme northern part of the State, and it is reported to occur near Maryville, Missouri.

19. RUBUS TRIVIALIS Michaux. RUNNING BLACKBERRY.

Recorded by Tracy as common in Missouri on his own authority but it is impossible now to tell which one of the procumbent species Tracy had in hand, unless his specimens are still in some collection.

20. ROSA BLANDA Aiton. SMOOTH WILD ROSE.

Recorded by Tracy as common in Missouri on his own authority, but Tracy knew very little about the Roses at the time he wrote his Flora, and the species he had in mind was probably some one of the *Cinnamomeae*, several species of which are common in many places in the State.

Cited for Missouri by Britton & Brown in Illustrated Flora.

Cited for Missouri by Robinson and Fernald in Manual.

There are no specimens in the Gray Herbarium to support this citation, but there is a specimen from Jackson County, collected by Broadhead in 1864, which I have not seen, and which must be either *R. Bushii* or *heliophila*, as these are common where Broadhead collected in Jackson County, and they cannot possibly be *R. blanda*.

Quite recently this species has been found in Clark Coun-

ty, at Dumas, along the bluffs of the Des Moines River, by Mr. Palmer and myself.

21. *ROSA LUCIDA* Ehrhart.

WILD ROSE.

Recorded by Tracy as common in Missouri on his own authority, and no doubt based on specimens of *R. carolina* L., as now understood, a species not given by Tracy in his Flora.

Tracy also records *R. carolina* (i. e. *R. palustris*) for Boone County, but Boone County is far out of the range of the swamp rose, which is only found in the lowlands of the southeastern part of the State.

22. *ROSA NITIDA* Willdenow.

WILD ROSE.

Recorded by Tracy for Jackson County on authority of Bush, but at the time the writer made that determination no one knew much about the North American species of *Rosa*.

23. *ROSA WOODSII* Lindley.

WILD ROSE.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Robinson and Fernald in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

Cited for Missouri by Small in Flora.

No specimens are known upon which the citations above are based, and as the range of this species is far to the north and northwest, these citations are all erroneous.

24. *PIRUS ANGUSTIFOLIA* Aiton. NARROW-LEAVED CRAB APPLE.

Recorded for Jackson County by Tracy on authority of Bush, but this is what is now known as *Malus lancifolia* Rehder.

Recorded for Saint Louis County by Tracy on his own authority, but no means are at hand now to tell just what Tracy's specimens really represented.

Recorded from Mississippi County by Tracy on authority of Galloway, and if Galloway's specimens are ever found it may be possible to determine the species they belong to.

Recorded for Missouri by Eggleston in Deam's Trees of Indiana, but I can scarcely believe that the real *Malus angustifolia* ever gets up into Missouri.

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25. *PIRUS ARBUTIFOLIA* Linnaeus. CHOKEBERRY.

Recorded for Holt County by Tracy on authority of Broadhead, but Broadhead must have confused the Choke Cherry with this species when he wrote that.

26. *PIRUS CORONARIA* Linnaeus. CRAB APPLE.

Cited for Missouri in Britton & Brown's Illustrated Flora, but evidently an error in determination, as no specimens of *Malus fragrans*, the *M. coronaria* of the Illustrated Flora, have been seen from Missouri.

Recorded as common in Missouri by Tracy on his own authority, and I venture the guess that his specimens must have been what we now recognize as *M. ioensis* (Wood) Britton.

27. *MALUS FRAGRANS* Rehder. CRAB APPLE

Recorded for Missouri by Eggleston in Deam's Trees of Indiana, but no specimens are known from the State by the writer. Eggleston now regards this the same as what has been called *M. coronaria*, and the same as *M. glaucescens*.

28. *MALUS GLAUDESCENS* Rehder. CRAB APPLE.

Recorded for Missouri by Eggleston in Deam's Trees of Indiana, but Eggleston certainly did not know this species, as he refers to it the following: Courtney, *Bush* 3869, April 29, 1906, and Monteer, *Bush* 6518, October 20, 1911. The Courtney specimens cited above are the type collection of *M. lancifolia* Rehder, and the Monteer specimens cited are the co-type collection of *M. ioensis Bushii* Rehder, two entirely different species.

29. *CRATAEGUS AMABILIS* Ashe. RED HAW.

Recorded for Missouri by Ashe, and his type specimens were from Keokuk, Iowa. No one seems to know what this species is, although Ashe says it is a *mollis* species, and that it has the leaves rounded or even cuneate at the base. If rediscovered, this tree might look more distinct in the field than the description would imply.

30. *CRATAEGUS BELLICA* Sargent. RED HAW.

Recorded for Missouri by Palmer in the Bulletin of the

Arnold Arboretum, but no specimens are cited. This species is included in this list merely to call attention to the record of its occurrence.

31. CRATAEGUS BERBERIFOLIA T. & G. RED HAW.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora, who reduces *C. Engelmanni* to synonymy and the same species, and Eggleston evidently refers to *C. Engelmanni* when he cites Missouri as part of the range of *C. berberifolia*.

32. CRATAEGUS BILTMOREANA Beadle. RED HAW.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Eggleston in the Robinson and Fernald Manual.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

Eggleston has referred specimens collected by me to this species, which he says is the same as *C. intricata*, but even at that, *C. intricata* Lange, has not been found in Missouri as far as I know.

33. CRATAEGUS CALPODENDRON (Ehrh.) Medicus. RED HAW.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

Recorded for Missouri in Dean's Trees of Indiana by Eggleston.

Eggleston says this is the same as *C. tomentosa* L., of Sargent, but *C. tomentosa* L. is a tree-form, and therefore *C. Calpodendron* should be a tree-form, and as such would have been recognized by Sargent in his Manual.

Eggleston has referred specimens collected by me, and also Riehl, Eggert, Engelmann, Haase, Kellogg and Glatfelter, to this species, and has also referred the same specimens of mine to *C. tomentosa Chapmani*. I have no knowledge of *C. tomentosa* or *C. Chapmani* in Missouri.

34. CRATAEGUS COCCINEA Linnaeus. SCARLET HAW.

Recorded as common in Missouri by Tracy on his own authority, but the real *C. coccinea* has never been collected in the State.

The range of *C. coccinea* as given in Britton's Manual, 1905, included Missouri, but evidently that is an error.

Recorded for Miller County by Tracy on authority of Wirick, but it is impossible to tell what species Wirick had in hand. Tracy did not know that *C. coccinea viridis* T. & G., was only a synonym for *C. coccinea*, and he did not know the species of *Crataegus* at all. He records *C. spathulata* for Boone County on his own authority, and certainly erroneously. He records the same species for Miller County on authority of Wirick, but Wirick was also mistaken in his determination. He also records the same species for Saint Charles County, on authority of Broadhead, but some other species was mistaken by Broadhead for *C. spathulata*, and it is needless to say that all these records of *C. spathulata* for Missouri are erroneous.

35. CRATAEGUS COLLINA Chapman.

RED HAW.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

Recorded for Missouri by Eggleston in Deam's Trees of Indiana.

Eggleston had referred specimens collected by me to this species, but it is very doubtful if this species gets up into this State.

36. CRATAEGUS CRUS-GALLI Linnaeus.

COCKSPUR THORN.

Recorded as common in Missouri by Tracy on his own authority, but Tracy never knew what *C. crus-galli* really was. It may be that this species, so long sought after in this State, may occur in the extreme northeastern part of the State, and it may be that some one or more forms having pink or red anthers may really be *C. crus-galli*. Much field-work and more extensive collections in the *Crus-galli* group will be necessary to establish the fact of the occurrence of this species in the State.

37. CRATAEGUS DENARIA Beadle.

RED HAW.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

Eggleston refers Davis 195, October 10, 1909, Clarksville, to this species, but this is certainly a mistake.

Eggleston refers *C. Palmeri* to *C. denaria* Beadle, and evidently the Missouri reference above is based on *C. Palmeri*, but Davis 195 is not *C. Palmeri*.

38. CRATAEGUS DEPRESSA Ashe.

RED HAW.

Cited for Jackson County, Missouri, by Ashe in the Elisha Mitchell Journal. Type specimens were collected in northeastern Missouri, but Ashe erroneously referred specimens of *C. Mackenzii* to this species.

Eggleston has referred this to *C. pruinosa*, and *C. Mackenzii* also, but it is very doubtful if *C. pruinosa* has been found in Missouri.

39. CRATAEGUS DILATATA Sargent.

RED HAW.

Cited for Missouri by Eggleston in the Robinson and Fernald Manual.

Eggleston has referred *C. speciosa* to *dilatata*, but is very doubtful if the real *C. dilatata* occurs in Missouri and the citations above must refer to *C. speciosa*.

40. CRATAEGUS FLAVA Ait.

SUMMER HAW.

Recorded for Putnam County by Tracy on authority of Swallow, but certainly a mistake in determination.

Recorded for Boone County by Tracy on his own authority, and also a mistake in determination.

Cited for Missouri by Britton in Manual, but this is a mistake, as Missouri is entirely beyond the range of this species.

41. CRATAEGUS INTRICATA Lange.

RED HAW.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora, but no specimens of the real *C. intricata* are known from the State, and I am unable to say what species Eggleston had in mind when he wrote that.

42. CRATAEGUS MACRACANTHA (Lindl.) Lodd.

RED HAW.

Cited for Missouri by Britton in Manual, but no specimens known to substantiate this citation.

Specimens recently collected north of Dumas, Missouri,

near the Iowa line, on the Des Moines River, have been determined as this species, but they may not be.

43. CRATAEGUS OBESA Ashe. RED HAW.

Cited for Missouri by Ashe, but nothing is known of this species beyond what the describer has given us.

44. CRATAEGUS PRATENSIS Sargent. RED HAW.

Cited for Missouri by Eggleston in the Robinson and Fernald Manual.

Eggleston refers *C. Palmeri* and *C. denaria* both to this species, and it is probable that the citation above refers to *C. Palmeri*, but it is very doubtful if the real *C. pratensis* has ever been found in Missouri.

45. CRATAEGUS PRUINOSA (Wendl.) K. Koch. RED HAW.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Eggleston in the Robinson and Fernald Manual.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

Recorded for Missouri by Eggleston in Deam's Trees of Indiana.

Eggleston says this species under various synonyms occurs throughout Missouri, but I doubt very much if the real *C. pruinosa* has ever been collected in Missouri.

46. CRATAEGUS PRUNIFOLIA (Marsh.) Pers. RED HAW.

Cited for Missouri by Britton in Manual, but it is very likely that this is only a synonym of *C. crus-galli* L.

As to the occurrence in Missouri of *C. crus-galli*, see remarks under the species.

47. CRATAEGUS PUNCTATA Jacq. RED HAW.

Recorded for Boone County by Tracy on his own authority, but that certainly was a mistake, for this species has not yet been found in the State.

Recorded for Jackson County by Tracy on authority of Bush, but that also was a misidentification.

Recorded for Pike County by Tracy on authority of Pech,

but Pech must have mistaken some other species for this, and *C. punctata* is still a desideratum for Missouri.

It may possibly occur in extreme northeastern Missouri.

48. CRATAEGUS REVERCHONI Sargent. RED HAW.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

Eggleston refers *C. rubrisepala*, *C. rubrifolia* and *C. jasperensis* to this species, and it is one or the other that is referred to in the citation. If *C. Reverchoni* is to be kept distinct, it is not found in Missouri.

49. CRATAEGUS STRAMINEA Beadle. RED HAW.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora, but no specimens are known upon which to base this citation.

Eggleston says that *C. intricata* Sargent, and *C. apposita* Sargent, are synonyms of this, but neither of these has been found in Missouri.

50. CRATAEGUS TOMENTOSA L. RED HAW.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Small in Flora.

Eggleston says this is the same as *C. Calpodendron*, but even at that *C. Calpodendron* has not been collected in the State.

51. CRATAEGUS UNIFLORA Muench. RED HAW.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Eggleston in the Robinson and Fernald Manual.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

It is evident that all these citations refer to *C. trianthophora* Sargent, as Eggleston regards this the same as *C. uniflora*, but no specimens of the real *C. uniflora* have been collected in the State.

52. CRATAEGUS VAILIAE Britton. RED HAW.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Eggleston in Britton & Brown's Illustrated Flora.

Eggleston considers *C. missouriensis* the same as *C. Vailiae*, but I do not think this view is tenable, and the citation above must be based on *C. missouriensis*.

53. CRATAEGUS VERNA Ashe. RED HAW.

Cited for Missouri by Ashe, but no one seems to know what this species is. If it is a valid species it ought to be found in extreme northeastern Missouri.

54. CRATAEGUS VESCA Ashe. RED HAW.

Cited by Ashe for Missouri, but no one seems to know what this species is. It is a *mollis* species, with very small round leaves and globose fruit. It ought to be found along the Des Moines River in Clark County.

55. AMELANCHIER CANADENSIS ALNIFOLIA Gray. JUNE-BERRY.

Recorded for Jackson County by Tracy on authority of Bush, but this was an error, as the shrubs upon which the identification was based proved to be cultivated plants, as afterwards ascertained.

56. AMELANCHIER CANADENSIS OBLONGIFOLIA Gray. JUNE-BERRY.

Recorded for Greene County by Tracy on authority of Shepard, but evidently an error in identification, as no specimens of this species are known from the State.

Cited for Missouri by Eggleston in the Robinson and Fernald Manual, but no specimens are known to support this citation.

Several specimens collected by Palmer and myself have been referred to this species, but they undoubtedly are only *C. Canadensis*.

57. AMELANCHIER LAEVIS Wiegand. JUNE-BERRY.

Cited for Missouri by Wiegand in Rhodora.

Recorded for Missouri by Eggleston in Deam's Trees of Indiana.

No specimens have been seen by me of this species, but

it is not unlikely that it occurs in extreme northeastern Missouri, as it is cited by both Wiegand and Eggleston.

58. *HYDRANGEA RADIATA* Walter. HYDRANGEA

Recorded for Greene County by Tracy on authority of Shepard, but this surely must have been *H. arborescens*, as no specimens of *H. radiata* have been seen from Missouri.

59. *HYDRANGEA ARBORESCENS* DEAMII St. John. HYDRANGEA.

Recorded for Missouri by Deam in Shrubs of Indiana.

This newly-described variety is said to differ from the typical form in having the under surface of the leaves densely pubescent. I am inclined to believe this is a mere form of the species, not worthy of recognition.

60. *HYDRANGEA ARBORESCENS* OBLONGATA T.&G. HYDRANGEA.

Recorded for Missouri by Deam in Shrubs of Indiana, but this must be a mere leaf-form, not worthy of recognition as a variety.

61. *RIBES AUREUM* Pursh. BUFFALO CURRANT.

Recorded as common in Missouri by Tracy on his own authority, and it is not common in rocky woodlands as stated by Tracy, nor did Tracy ever see it in Missouri unless the shrubs were cultivated.

Cited for Missouri by Britton in Manual, evidently based on some earlier report, probably Tracy's.

Cited for Missouri by Robinson and Fernald in Manual, evidently copied from some earlier authority.

The two citations above evidently refer to *R. odoratum*, the only yellow-flowered *Ribes* in the State. This species occurs along rocky bluffs of the White River, near Swan and along the high bluffs of the same stream at Forsyth, but there only recently discovered, and it is very probable that the White River species is undescribed.

62. *RIBES ROTUNDIFOLIUM* Michx. GOOSEBERRY.

Recorded as common everywhere in Missouri by Tracy on his own authority, but Tracy was certainly mistaken in this, as no specimens of this species are known from the State.

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63. CORNUS CIRCINATA L'Her. ROUND-LEAVED DOGWOOD.

Recorded as common on the bluffs of Eastern Missouri by Tracy on his own authority, but as Tracy does not record *C. alternifolia* which does grow on bluffs in Eastern Missouri, it is probable that this is what Tracy found.

64. CORNUS STOLONIFERA Michx. RED DOGWOOD.

Recorded from Johnson County by Tracy on authority of Bush, but this was a mistake in determination by me, as the specimen proved to be *C. obliqua* Raf.

Recorded for Mississippi County by Tracy on authority of Galloway, and certainly an error, as no specimens of this species are known from the State by the writer.

65. VIBURNUM DENTATUM L. ARROW-WOOD.

Recorded as common in Missouri by Tracy on his own authority, but no specimens are known to the writer from the State, and it is probable that specimens of what has since been described as *V. affine* were mistaken for *V. dentatum*, but *V. affine* occurs only in the elevated wooded portion of Eastern Missouri.

66. VIBURNUM LANTANOIDES Michx. HOBBLE-BUSH.

Recorded for Madison County by Tracy on authority of Broadhead, but I cannot imagine what shrub Broadhead mistook for this species, as nothing like *V. lantanoides* has been found in Missouri.

Recorded for Saint Louis County by Tracy on his own authority, but no shrub resembling *V. lantanoides* has been seen in the State by the writer, and I think Tracy must have had a cultivated specimen in hand when he wrote this. Tracy also records *Carya porcina* for Missouri on his own authority, but it is very doubtful if Tracy ever saw the real *C. porcina* in the State.

67. VIBURNUM LENTAGO L. SHEEP-BERRY.

Cited for Missouri by Britton in Manual, the citation being based on what Ashe has described as *V. Bushii*, without doubt.

Recorded for Jackson and Greene Counties by Tracy on

authority of Bush, but these were mistakes, and were what is now called *V. Bushii*.

Recorded for Miller County by Tracy on authority of Wierick, and doubtless a mistake.

Recorded for Saint Louis County by Tracy on authority of Letterman, and probably erroneous.

The real *V. Lentago* of the eastern States is a shrub of low wet swampy or boggy places, and ranges from Quebec to Northern Indiana, Northern Illinois, Iowa, Minnesota, North Dakota, Saskatchewan and westward. The shrub generally recognized as *Lentago* in Missouri, never grows in wet places, swampy places or bogs, but is found on rocky bluffs and banks, rocky beds of little dry branches on the prairies, and in rocky barrens on the prairies.

68. *VIBURNUM OPULUS* L.

CRANBERRY-TREE.

Recorded for Saint Louis County by Tracy on authority of Murtfeldt, but undoubtedly this must have been from a cultivated shrub, as nothing like *V. Opulus* has ever been found in Missouri.

69. *LONICERA GRATA* Ait.

AMERICAN WOODBINE

Recorded for Davies County by Tracy on authority of Broadhead, and evidently based on an erroneous determination by Broadhead. No specimens of this species have ever been seen by the writer from the State.

70. *LONICERA HIRSUTA* Eaton.

HAIRY HONEYSUCKLE.

Recorded for Ralls County by Tracy on authority of Broadhead, evidently based on a misidentification of some other species of *Lonicera*. Since *L. jajonica* was not included in Tracy's Flora, and it had not yet become so firmly established throughout the State, it is likely that Broadhead saw this species in Ralls County where it had escaped, and mistook it for *L. hirsuta*, which would be quite reasonable for Broadhead to do, he not being well versed in the native flora of the State.

71. *IVA FRUTESCENS* L.

Recorded from Boone County by Tracy on authority of Galloway, but this coastal species has not been found in the

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interior, and Galloway must have made an error somewhere about this.

72. GAYLUSSACIA DUMOSA T. & G. DWARF HUCKLEBERRY.

Recorded for Newton County by Tracy on authority of Broadhead, but a careful exploration of Jasper, Newton and McDonald Counties by Mr. Palmer and myself has failed to reveal this species there, and it is evident that Broadhead made an erroneous determination of his specimens.

73. GAYLUSSACIA RESINOSA T. & G. BLACK HUCKLEBERRY.

Recorded for Miller County by Tracy on authority of Wirick, but Wirick was merely an amateur in botany and evidently made an error in determination of his specimens, as this species is still unknown to the writer for Missouri.

74. VACCINIUM CORYMBOSUM L. SWAMP HUCKLEBERRY.

Recorded for Greene County by Tracy on authority of Shepard, but Shepard evidently mistook some other species of *Vaccinium* for this species.

Recorded for Iron County by Tracy on authority of Broadhead, but Broadhead did not know the *Vaccinium* species, and he evidently made an erroneous determination of his specimens, and no specimens of *corymbosum* are known to prove its occurrence in the State.

75. VACCINIUM PENNSYLVANICUM Lam. DWARF BLUEBERRY.

Recorded as common southeast by Tracy on his own authority, but no specimens have ever been seen by the writer from anywhere in the State, and no species of *Vaccinium* is common in southeastern Missouri.

76. VACCINIUM TENELLUM Ait. SMALL BLACK BLUEBERRY.

Cited for Missouri by Robinson and Fernald in Manual, but no specimens are known to support this citation, and a study of a great many specimens of this species showed that it does not reach Missouri, and that this citation is erroneous.

77. ARCTOSTAPHYLOS UVA-URSI (L.) Spreng. BEARBERRY.

Recorded for Missouri by Tracy on authority of Broadhead, who reports it from southeast Missouri, but no speci-

mens are known from the State, and it is very improbable that Broadhead ever found this species in Missouri.

Cited for Missouri by Robinson and Fernald in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

I have been unable to discover what the two citations, just above, were founded upon, but they must have been copied from some earlier citation, and this citation was based on an erroneous determination, or possibly on some collection that I have never been able to locate.

78. *LEUCOTHOE RACEMOSA* Gray.

Recorded for Madison County by Tracy on authority of Broadhead, but evidently an error on the part of Broadhead, as no specimens of this species are known from Missouri.

79. *RHODODENDRON NUDIFLORUM* Torr. PURPLE AZALEA.

Recorded for Madison County by Tracy on authority of Broadhead, but no specimens of this species are now known from the State, and if Broadhead collected some species of *Rhododendron* in Madison County it must have been another than *R. nudiflorum*.

80. *BUMELIA TENAX* Willd.

Recorded for Miller County by Tracy on authority of Wirick, and I am unable to guess what Wirick had in hand when he made his determination, as no species of *Bumelia* gets up into Miller County so far as I know, and this southern species does not get up so far as Missouri.

81. *CHIONANTHUS VIRGINICA* L. WHITE FRINGE.

Recorded for Mississippi County by Tracy on authority of Galloway, but no specimens of this species have been seen by Mr. Palmer or myself, although we have collected all around Mississippi County. It occurs in several Counties in northeastern Arkansas very close to the Missouri line, and it is probable that it occurs in one or more Counties in the extreme southern part of the state.

Cited for Missouri by Robinson and Fernald in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

There are no specimens to substantiate the two citations above, and many of the earlier authors and writers cited this species for Missouri, and that is the most interesting species we have on account of it being so long accepted as a Missouri species, when in fact there seems to be no evidence that ever it was collected in the State.

82. *CALLICARPA AMERICANA* L. FRENCH MULBERRY.

Recorded for Miller County by Tracy on authority of Wirick, but Wirick must have had specimens of some other shrub in hand when he made this determination, perhaps *Symphoricarpos orbiculatus*.

Cited for Missouri by Robinson and Fernald in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

It is evident that Robinson and Fernald and Britton & Brown copied from some earlier citation of this species for Missouri, and it is barely possible that some early collector really did collect this in some as yet, by me, unexplored part of Southeastern Missouri.

83. *LINDERA MELISSAEFOLIUM* Blume.

Recorded for Greene County by Tracy on authority of Shepard, but collections in and around Greene County by both Mr. Palmer and myself during the past fifteen years, have failed to reveal this species, and it is safe to assume that Shepard must have erred in naming his specimens.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Robinson and Fernald in Manual.

There is a form that is common in Southern Missouri, that has pubescent twigs and leaves, and is certainly some different from *L. Benzoin*, and it may be the real *L. melissaefolium* of Blume, but it is not the species so regarded in the Manuals now.

84. *SHEPHERDIA ARGENTEA* Nutt. BUFFALO BERRY.

Recorded for Missouri by Tracy on authority of Wood in Botanist and Florist, and no doubt an error of range on the part of Wood, as this species is far to the northwest of this State.

85. *FRAXINUS CAROLINIANA* Walt.

WATER ASH.

Cited for Missouri by Robinson and Fernald in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

It is impossible to tell now just how this erroneous citation first started, but it seems to have been copied one from another, and no specimens are known from the northern States.

86. *SEBASTIANA LIGUSTRINA* Mull.

Recorded for Saint Louis by Tracy on authority of Geyer, but Geyer's specimens if determined correctly, must have been collected in the South, as this species is not known to the northern flora. Geyer also reported *Carex Willdenovii*, *Gratiola aurea* and *Viola cucullata cordata*, for Missouri, of which no specimens are known to the writer from Missouri.

87. *QUERCUS CATESBAEI* Michx.

Recorded for Missouri by Tracy on authority of Engelmann, but certainly this is an error, as this southern oak does not get up into the northern flora. Engelmann also reported *Helianthus giganteus* for Missouri, which is clearly a mistake.

88. *QUERCUS CINEREA* Michx.

UPLAND WILLOW OAK.

Recorded for Missouri by Tracy on authority of Swallow in Geological Report, but certainly based on specimens of some other oak, as this species does not get up into the northern flora.

89. *QUERCUS COCCINEA* Wang.

SCARLET OAK.

Recorded for Missouri by Tracy on his own authority, who says it is common in Missouri, but Tracy did not know the species of *Quercus*, and there is little doubt that Tracy had some other species in mind when he wrote this.

This species has been commonly credited to Missouri for the last 80 years, by many collectors, writers and authors.

Cited for Missouri by Britton in Manual.

Cited for Missouri by Britton & Brown in Illustrated Flora.

Cited for Jerome, Missouri, by Sargent in Manual, based on collections of Kellogg, but very doubtful if this species.

Mr. Palmer has recently collected some interesting specimens of *Quercus* near Poplar Bluff, which he refers to this species. One of these has the leaves as in typical *coccinea*, and he places this under the typical form of that species. The other collection has leaves a little different from the typical form of *coccinea*, and the fruit is much larger, quite different in shape and texture, and the cup is quite shallow, much more so than in any *coccinea* of the East. Mr. Palmer has placed this other specimen under *Q. coccinea tuberculata* Sargent, but it appears to me that both of these collections represent but one species, and that species not *coccinea*. It is well known that *Q. Schneckii* varies in its fruiting characters just like this unknown species of Poplar Bluff, and that the form with shallow cups, large fruit, and slightly differently shaped leaves have been taken by Sargent to represent *Q. Shumardii* Buckley, a species of the lowlands of southeastern Missouri, Arkansas and Texas. *Q. rubra* (*Q. macrocarpa*) also varies in its fruiting characters, leaf characters, and even bud characters, as does also *Q. velutina*.

90. CASTANEA VULGARIS AMERICANA Walt. CHESTNUT.

Recorded for New Madrid County by Tracy on authority of Swallow, but if this was a chestnut, it must have been a cultivated tree, as this species is not known West of the Mississippi River, or it is barely possible that Swallow must have had a tree of *Quercus Muhlenbergii* in mind, as this is often called Chestnut Oak.

91. BETULA ALBA POPULIFOLIA Sp. WHITE BIRCH.

Recorded as common along streams by Tracy on his own authority, but Tracy must have mistaken some form of *B. nigra*, our only species, for this species.

92. ALNUS INCANA Willd. SPECKLED ALDER.

Recorded for Mississippi County by Tracy on authority of Galloway, but Galloway must have had specimens of *A. rugosa* in hand when he made his determination, as that is

the only species of *Alnus* of this section known to the writer in the State.

93. *SALIX CANDIDA* Willd.

HOARY WILLOW.

Recorded by Tracy for Iron County on authority of Broadhead, but Broadhead knew almost nothing about the species of *Salix*, and he evidently made an erroneous determination of his specimens.

94. *SALIX LUCIDA* Muhl.

SHINING WILLOW.

Recorded for Jackson County by Tracy on authority of Bush, but, at that time the writer knew scarcely anything about *Salix* species, and made an erroneous determination.

95. *SALIX PETIOLARIS* Smith.

PETIOLED WILLOW.

Recorded for Jackson by Tracy on authority of Bush, and certainly a mistake, as the writer was then very inexperienced in naming *Salix* species, and erroneously determined some *Salix* specimens for this species.

96. *JUNIPERUS COMMUNIS* L.

JUNIPER.

Recorded for Greene County by Tracy on authority of Shepard, but Shepard must have mistaken specimens of trees of *J. virginiana* for this species.

97. *SMILAX GLAUCA* Walt.

GREENBRIER.

Recorded for Missouri by Tracy on authority of Swallow, but Swallow did know the *Smilax* species, and evidently made an erroneous determination of his specimens.

BOOK REVIEWS

In this section are reviews of new, or particularly important and interesting books in the fields of natural science. Books dealing with botany or kindred subjects should be sent to the Editor, the University of Notre Dame. *All other books for review should be sent to Carroll Lane Fenton, at the Walker Museum, the University of Chicago, Ill.* Publishers are requested to furnish prices with books.

HUNTING WITH THE CAMERA. By William Nesbit. E. P. Dutton & Co., New York. Price \$10.00.

This interesting and comprehensive volume of 337 pages contains information on every detail of photography. It is technical enough to satisfy the professional photographer and, at the same time, simple enough to be of genuine service to the beginner. After an interesting preface and a practical three-page exhortation to the beginner, the author discusses such subjects as the following: Wild Life Conservation, Branches of Photography, Glimpses of the Vanishing Animal Kingdom of Africa, Cameras, Lenses, Exposure, Development, Flash-light, Apparatus, and Transparency Devices. In Chapter V., we have some valuable historical and biographical data presented under the title "A Partial Who's Who in Nature Photography."

The price of the book seems rather prohibitive. But the make-up of the volume in general,—paper, print, binding—leaves little to be desired. There are twenty-four figures illustrating technical points of the camera and accessories, and about one hundred and fifty fine illustrations. All in all, it is the best and most comprehensive book of its kind that has come to our notice.—F.J.W.

COLLEGE ZOOLOGY. By Robert W. Hegner. The Macmillan Co., New York. Price \$3.50.

There is still a great deal of difference of opinion regarding the most effective method of teaching the natural sciences. Many believe that zoology and botany should be presented, especially to beginners, in a combination course, called biology. Others think that we should teach zoology and botany in separate classes. Indeed, some of our larger colleges have separate buildings to house these two departments. Among those who prefer separate courses in zoology and botany there is wide difference of opinion as to the proper method of presentation to be followed in each subject. Some teachers begin with the Protozoa and lead the student slowly and somewhat laboriously through the entire

animal kingdom. Others begin with a more highly organized animal, such as the frog, and cover the entire field in more or less rambling fashion. Hegner begins at the beginning and leads the student by slow stages through the entire animal kingdom. The revised edition of his *College Zoology* follows the general outline of the first edition. The classification has been elaborated somewhat. This feature of the new edition does not appeal to us. The older classification as given in the old text was comprehensive enough and was more suitable for the beginner. However, this is the only adverse criticism that we have to offer on the new book. The foot notes at the beginning of each chapter are especially valuable. About seventy new illustrations have been added, and in all the illustrations, names have been substituted for guide letters. There is a good table of contents and a complete index. Altogether the new Hegner is a text book that presents the subject of systematic zoology better than any other text known to us.—F.J.W.

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